

SARA TITLE III SECTION 313 INSPECTION REPORT

Report Date: April 8, 2002

I. Facility : Baltimore Quality Assurance  
4200 Boston Street  
Baltimore, Maryland 21224

SIC: 2099

Parent Company: Cosmed Group  
8 Industrial Drive  
Coventry, RI 02816

II. Date of Inspection: February 5, 2002

III. EPA Inspector : Marilyn Gower  
Environmental Scientist  
Office of Enforcement, Compliance and Environmental Justice

IV. Official Representing Company :

Ellen Heath, Plant Manager, 410 327 0916  
Mark Kloster, Cosmed Group of Illinois, 847 785 1060 (by phone)  
Mark Gronchi, Employee, Baltimore Quality Assurance

Robert Somerman , American Chemical Exchange<sup>1</sup> 909 484 2542

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<sup>1</sup>Responded same day by telephone to the EPA inspector.

## V. Opening Conference

### 1. Introduction

On February 5, 2002 an EPCRA Section 313 inspection was conducted at Baltimore Quality Assurance in Baltimore, Maryland. Section 313 was the primary focus of the inspection. A plant, factory or other facility comes under the provisions of Section 313 if, 1) its primary SIC code is from 2000 through 3999, 2) if, in addition, it has 10 or more full-time employees and, 3) if it meets the threshold criteria for reporting.

The inspector's credentials were presented to Ms. Heath and the inspector reviewed the purpose of the inspection which was 1) to verify the names and amounts of 313 chemicals manufactured, processed or otherwise used at the facility and, 2) to review the methods used for determining the information submitted on Form R's from 1998, 1999 and 2000. The facility was selected based on its relatively low amounts of air releases for the amount of 313 compound treated.

Approximately two weeks before the inspection, a letter was sent to the company by EPA staff notifying the public contact listed on the submitted Form R, that specific records should be available for review during the inspection. Prior to the inspection, Form R reporting data for 1998 - 2000 was reviewed.

### 2. Facility Description

At this location Baltimore Quality Assurance has a staff of fifteen persons who offload ships and sterilize food products from the Port of Baltimore. They also fumigate designated shipped cargo using methyl bromide and provide warehousing for cargo. This facility started operations in 1992.

Inside the facility there are five sterilization chambers for ethylene oxide processing. The chambers range in size from 5,800 ft<sup>3</sup> to 1,872 ft<sup>3</sup>. The product for sterilization is placed in the relevant chamber. The chamber is exhausted, heated and a mixture of 20% ethylene oxide and 80% CO<sub>2</sub> is pumped into the chamber. After a predetermined amount of "dwell" time, which may run as much as 24 hours to 48 hours, the ethylene oxide is extracted from the chamber six or seven times with air. All air from the chamber is exhausted to the scrubber system. The ethylene oxide reacts with water, treated to a pH of 2 by the addition of sulfuric acid, to form ethylene glycol.

## VI. Threshold Determination

For determining if any chemical usage meets the reporting threshold for Section 313 compounds, Ms. Heath sends all purchase records to the Cosmed corporate office in Coventry, Rhode Island. A list is made of what was sent to the corporate office and copies are provided to Mark Kloster along with the actual receipt date and the usage. Mark Kloster at Cosmed of Illinois does the review for threshold determination and was on a speaker phone from Illinois during the inspection. Copies of the usage form are <sup>2</sup>attachment 1. Section 313 reporting is required if threshold quantities for specifically listed chemicals are exceeded. Thresholds apply to the amount of EPCRA Section 313 chemical that is manufactured, processed or otherwise used.

## VII. Sara Title III

A Form R was submitted for ethylene oxide (ETO) in 1998 - 2000. Mr. Kloster completed the Form R for the relevant years. The 313 compound ethylene oxide is used in the vapor form for the sterilization process and the Form R reporting activity /use is listed as "Otherwise Used - Ancillary/Other". To calculate the amount of a 313 compound for the Form R submission, stack efficiency tests were conducted for the ethylene oxide scrubber when the facility first started operations. The test date was January 26, 1993. Copies of the test data are attachment 2

The current scrubber system was installed November 1999. Stack tests were conducted by the contractor, ETS from Roanoke, Virginia in March 2000. Copies of the test data are attachment 3.

The 313 compound, ethylene glycol is co-incidentally manufactured as a byproduct of the reaction. Ethylene glycol is reported on the Form A as, according to the facility representative, Mark Kloster, less than 500 pounds are released to the environment. The contractor, American Chemical Exchange (ACE), handles the ethylene glycol for recycle. According to Ms. Heath, the plant manager, it cost between \$3000 and \$4000 to haul the ethylene glycol for recycle which is approximately the same amount as paid to discharge the ethylene glycol to the POTW. Previously the ethylene glycol was discharged to the POTW and the plant was out-of-service until the discharge was completed which was several days according to Ms. Heath. The ethylene glycol is no longer discharged to the POTW.

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<sup>2</sup>Gas Usage Per Chamber on the first page of this attachment is "per day"

With regard to the Form A submitted in place of a Form R for ethylene glycol, facilities which have a total *annual reportable amount* of no greater than 500 pounds for a listed toxic chemical may qualify for the one million pound alternate threshold for that chemical. For purposes of applying the alternate threshold, the total *annual reportable amount* includes toxic chemicals listed in 40 CFR 372.65 which are transferred from the facility to off-site locations for the purpose of recycling. This total annual reportable amount must be less than 500 pounds in order to file a Form A in lieu of a Form R. The amount of ethylene glycol sent for recycling was greater than 500 pounds; therefore, a Form R should have been submitted for ethylene glycol for 1998, 1999 and 2000.

Mr. Kloster was asked to provide additional documentation that the ethylene glycol is recycled. Mr. Robert Somerman of ACE in California in a phone call to this inspector 2/5/02 confirmed that the ethylene glycol is usually 20% glycol and 80% water. Mr. Somerman said, currently, the solution is handled by US Filter and is distilled to reclaim the ethylene glycol; however, if the ethylene glycol is below 15% glycol then it is a wastewater issue and is treated as wastewater. Mr. Somerman said that the shipments handled by Spirit Processing in NC, dated 10/29/99 and 1/24/00, were handled as wastewater and the ethylene glycol was not recycled. The facility documentation shows the 10/29/99 shipment to be 5000 gallons and the 1/24/00 shipments to be 5000 gallons.

The record of glycol disposal (attachment 4) and the Form R submittal, calculating the amount of ethylene glycol co-incidentally manufactured and comparing it with the amount of wastewater/ethylene glycol solution removed for recycling, does not account for the amounts of ethylene glycol co-incidentally manufactured. See chart. Calculations for the chart are attachment 6.

Year	lbs. EO treated	lbs. of EG manufactured from EO hydrolysis	Gallons Hauled	lbs EG and wastewater recorded as disposed/recycled
1998	89,000 * .99 = 88,100	124,221	12,179	101,573
1999	78,000 * .99 = 77,220	108,852	10,000	83,400
2000	75,000 * .995 = 74,625	105,221	14,088	117,494

In 1998 the contractor, Bass Oil, Brooklyn NY, handled the glycol. Mr. Somerman and Mr. Kloster faxed the attachment five as documentation that there is a contract for recycling glycol.

The production ratio is based on sales.

#### Summary of Form R Submittal

Chemical/ Year / Use	Stack	Fug	Treatment			
			Off-site & POTW	Released	treated by scrubber onsite	scrubber efficiency
ethylene oxide / 1998 / O	890	none	none	890	89,000	99%
ethylene oxide / 1999 / O	780	none	none	780	78,000	99%
ethylene oxide/ 2000 / O	380	none	none	380	75,000	<sup>3</sup> 99.5%

#### VIII Findings

The total annual reportable amount of ethylene glycol for applying the alternate threshold must be less than 500 pounds in order to file a Form A in lieu of a Form R. A Form R should have been submitted for ethylene glycol for 1998, 1999 and 2000.

According to records and to phone conversation with Mr. Somerman, all ethylene glycol was not recycled.

The amount of ethylene glycol listed in the "Record of Glycol Disposals" for the reviewed years does not equal the amounts that were co-incidentally manufactured.

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<sup>3</sup>New scrubber installed

# Inspector Calculations

YEAR 2000

## **Amount of ethylene glycol produced from treatment (hydrolyzing) of ethylene oxide:**

Molecular Formula for ethylene oxide -  $C_2H_4O$

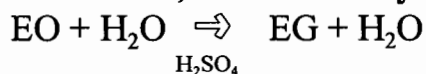
Molecular Formula for ethylene glycol -  $C_2H_6O_2$

Molecular weight of ethylene oxide = 44.05

Molecular weight of ethylene glycol = 62.07

75,000 lbs. of ethylene oxide treated in 2000 \* .995 (scrubber effic) = 74,625 lbs.

$1.41 * 74,625 \text{ lbs} = 105,221 \text{ lbs of ethylene glycol produced}$



## **Weight of hauled ethylene glycol for disposal/recycling:**

14,088 gallons of wastewater and glycol hauled away in 2000 times(\*) 8.34  
lbs./gallon = 117,494 lbs. of wastewater and ethylene glycol (which is 20%  
ethylene glycol and 80%  $H_2O$ )

01/24/00	5,000 gallons hauled
05/10/00	4,088 gallons hauled
11/17/00	5,000 gallons hauled

Year 1999

**Amount of ethylene glycol produced from hydration of ethylene oxide:**

Molecular Formula for ethylene oxide -  $C_2H_4O$

Molecular Formula for ethylene glycol -  $C_2H_6O_2$

Molecular weight of ethylene oxide = 44.05

Molecular weight of ethylene glycol = 62.07

78,000 lbs. of ethylene oxide treated in 1999 \* .99 (scrubber efficiency) =  
77,220 lbs

1.41 \* 77,200 lbs. = **108,852 lbs of ethylene glycol produced**

**Weight of hauled ethylene glycol for disposal/recycling:**

10,000 gallons of wastewater and glycol hauled away in 1999 \* 8.34 lbs/ gal =  
83,400 lbs of wastewater and ethylene glycol (weight of 20% ethylene glycol and  
80%  $H_2O$ )

OR USING THE SPECIFIC GRAVITY FOR ( 20% EG and 80%  $H_2O$ )

10,000 \* 8.523 lbs/gal = 85,230 lbs.

10/26/99                      5,000 gallons hauled

10/29/99                      5,000 gallons hauled

Year 1998

**Amount of ethylene glycol produced from hydrolyzing of ethylene oxide.**

89,000 lbs. of ethylene oxide treated in 1998 \* .99 (scrubber efficiency) =  
88,100 lbs

1.41 \* 88,100 lbs. = **124,221 lbs of ethylene glycol produced**

**Weight of hauled ethylene glycol for disposal/recycling:**

12,179 gallons of wastewater and glycol hauled away in 1999 \* 8.34 lbs/ gal =

101,573 lbs of wastewater and ethylene glycol (which is 20% ethylene glycol and 80% H<sub>2</sub>O)

4/01/98 4,000 gallons  
11/05/98 4,000 gallons  
11/06/98 4,179 gallons



Attachments

1. Usage 1998 - 2000 and record of chamber activities for one month Dec 1998
2. Scrubber test efficiency at start -up December 1, 1992
3. Scrubber test efficiency run March 22-23, 2000
4. Record of glycol disposals
5. Copy of contract with American Chemical Exchange. Documentation of glycol recycling



**Cosmed  
of Illinois**

ATTACHMENT 2

a Cosmed Group, Inc. affiliate

**To:** Ellen  
**Company:** BQA  
**From:** Mark *m d*  
**Pages:** 19 (Including this cover sheet)  
**Re:** Scrubber Test Information  
**Date:** Tuesday, February 05, 2002

Hi Ellen,

I have the test data from both tests that were performed at your facility. The January 26, 1993 test would obviously be the one that would apply to your scrubber in 1998 and 1999.

If you have any questions or comments please feel free to contact me at [mkloster@cosmedgroup.com](mailto:mkloster@cosmedgroup.com) or (847) 785-1060.

02/05/02

09:37

8477851069

COSMED OF IL

→→→ BQA

001

# CROLL-REYNOLDS COMPANY, INC.

CHEMICAL & MECHANICAL ENGINEERS

SINCE 1917

751 CENTRAL AVENUE

P. O. BOX 668

WESTFIELD, NJ 07091-9990

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COSMED Medical Sterilization  
3459 South Clinton Avenue  
South Plainfield, N.J. 07080

January 27, 1993

Attention: Mr. Vincent Caputo

Subject: Ethylene Oxide Scrubber  
Serial No. 63876

Dear Mr. Caputo:

As we discussed by telephone yesterday, January 26, 1993, although the original inlet gas temperature design was for 120F there would be no problem operating with an inlet temperature of 140F.

That is, all other parameters remaining the same, there would be virtually no measurable difference in the performance of the scrubber with an inlet temperature of 140F vs. 120F. The 99% removal efficiency would still apply.

We hope that this information is helpful.

Very truly yours,

  
R.J. Chironna

02/05/02 09:37 8477851069

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003/019

02/08/93 11:44 401 828 0648

COSMED MED STER --- SO PLAINFIELD

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EMISSIONS TESTING  
PRELIMINARY SUMMARY OF RESULTS  
BALTIMORE QUALITY ASSURANCE  
COUNTERCURRENT PACKED TOWER ETHYLENE  
OXIDE SCRUBBER

PREPARED FOR:

BALTIMORE QUALITY ASSURANCE  
4200 BOSTON STREET  
BALTIMORE, MD 21224

PREPARED BY:

COSMED MEDICAL STERILIZATION  
8 INDUSTRIAL DRIVE  
COVENTRY, RI 02816

SUBMITTED TO:

ENFORCEMENT PROGRAM AIR MANAGEMENT ADMINISTRATION  
STATE OF MARYLAND - DEPARTMENT OF THE ENVIRONMENT  
2500 BROENING HIGHWAY  
BALTIMORE, MD 21224

ATTN: MR. STEVEN PAPAMINAS

FEBRUARY 8, 1993

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### SUMMARY OF RESULTS

On December 1, 1992 testing of the Baltimore Quality Assurance countercurrent packed tower scrubber was initiated. The results of this test were inconclusive due to the fact that the primary standards ranged from 2.1 - 99.1 ppm and the test results exceeded the high standard. Data from this test is included for review but was extrapolated using the above mentioned standard curve. The initial results predicted a system efficiency between 97 - 99 %. Upon completion of this testing certified standards at 530, 1070, 5150 and 10290 ppm were ordered and the testing resumed on January 26, 1993.

On January 26, 1993 a re-test was initiated utilizing primary standards ranging from 9.9 - 530 ppm to assure accurate measurement of the stack emission. Three (3) determinations were performed resulting in a calculated scrubber efficiency of 99.0 % which yields a mass emission rate of 1.0 % of the total mass of ethylene oxide utilized in the sterilization process. Data from this re-test is also attached.

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BALTIMORE QUALITY ASSURANCE-STACK TEST  
SAMPLE CALCULATIONS

- ① Text
- ② Sample chromatogram
- ③ Std. Curves

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4. What do

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## SAMPLE CALCULATIONS: ETO STACK TESTING

## FLOW RATES CALCULATION:

$$FR = \pi (D/2)^2 * V$$

WHERE: FR=FLOW RATE IN CFM  
D=DIAMETER OF STACK  
V=STACK VELOCITY IN FEET/MINUTE

## CALCULATION OF ETO OUTPUT:

$$\begin{aligned} \text{ETO OUTPUT} \\ &= \text{ppm}(1.8\text{mg}/\text{m}^3/\text{ppm})(\text{ft}^3/\text{min})(\text{m}^3/35.34\text{ft}^3)(\text{kg}/10^6\text{mg})(2.201\text{lb}/\text{kg}) \\ &= 112(10)^{-1}(\text{PPM})(\text{FT}^3/\text{MIN})(\text{MIN}) = \text{OUTPUT LBS} \end{aligned}$$

$$\% \text{ EFFICIENCY} = 1 - (\text{MO}/\text{MA}) \times 100$$

WHERE MO=MASS OF Eto OUTPUT IN LBS  
MA=MASS OF Eto ADDED IN LBS

Inlet Mass = 42 lbs.

Calibrations



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02/08/93 11:45 404 828 0648

COSMED MED STL →→→ SO PLAINFIELD

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BALTIMORE QUALITY ASSURANCE-STACK TEST DATA

INITIAL TEST

RUN NO. 1 - 12/01/92

RUN NO. 2 - 12/02/92

02/05/02 09:38 8477851089

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008/019

02/08/93 11:45 46 328 0648

COSMED MED STA -&gt; SO PLAINFIELD

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## BALTIMORE QUALITY ASSURANCE STACK TEST

RUN NO. 1

STANDARD CURVE-12/01/92

PPM	2.1	9.8	50.0	99.1	PPM (%)	AREA (Y)
AREA	3222	13348	70112	148816	2.1	3179
	3209	13240	72680	148656	9.8	13291
	3105	13288	71380	150884	50.0	71381
					99.1	149379
AV. AREA	3179	13281	71381	149379		
STD. DEV.	52.86	49.34	1048.41	811.21	r=	0.99964
COEVAR.	0.02	0.00	0.01	0.01	y-int=	-1018.6
% DIFF.	1.6	0.3	1.6	0.6	m=	1603.34

TIME	ELAP. TIME	AREA	FT/MIN	CFM	PPM	LBS/MIN	LBS	%EFF.	COMMENTS
18:05:00									1ST EVAC START
18:08:25	00:03:25	54832	1510	298	97.2	0.1294	0.3701	98.1	3
18:10:27	00:05:27	87024	1326	280	45.3	0.1820	0.2640	99.4	2
18:12:26	00:07:26	78144	1181	228	62.7	0.1344	0.2689	99.4	2
18:14:28	00:09:28	83936	1026	201	68.6	0.1275	0.2560	99.4	2
18:18:35	00:11:35	87256	898	178	58.7	0.1180	0.2319	99.4	2
18:18:29	00:13:29	93480	784	150	82.9	0.1058	0.2112	99.5	2
18:20:34	00:15:34	158840	745	148	108.3	0.1742	0.3484	99.2	2
18:22:30	00:17:30		712	140					1ST EVAC END

TOTAL: 00:17:30

AVERAGE:

% EFFICIENCY:

200

59.9

0.1304

0.2785

99.3

TIME	ELAP. TIME	AREA	FT/MIN	CFM	PPM	LBS/MIN	LBS	%EFF.	COMMENTS
18:28:00			652	128					2ND EVAC START
18:28:19	00:02:19	2765240	1348	284	1833.4	5.4289	10.8538	74.2	2
18:30:38	00:04:38	185888	1172	230	111.0	0.2881	0.5723	98.8	2
18:32:53	00:06:53	183544	988	194	129.4	0.2806	0.5612	98.7	2
18:34:54	00:08:54	221184	876	172	147.8	0.2844	0.5688	98.8	2
18:37:03	00:11:03	248472	817	160	168.0	0.2882	0.5888	98.8	2
18:38:07	00:10:48	282596	744	148	175.3	0.2888	0.5737	98.8	2
18:40:20	00:14:20		860	128					2ND EVAC END

TOTAL: 00:14:20

AVERAGE:

% EFFICIENCY:

178

477.5

1.3153

2.6305

93.7

TIME	ELAP. TIME	AREA	FT/MIN	CFM	PPM	LBS/MIN	LBS	%EFF.	COMMENTS
18:42:06			846	127					3RD EVAC START
18:46:58	00:03:50	38832	1348	284	28.4	0.0781	0.1581	99.6	2
18:47:58	00:05:58	65828	1211	238	44.5	0.1186	0.2372	99.4	2
18:50:03	00:07:57	82728	1023	201	66.7	0.1253	0.2508	98.4	2
18:52:00	00:09:54	107112	928	182	71.9	0.1465	0.2929	99.3	2
18:53:58	00:11:52	124720	858	169	83.6	0.1580	0.3180	99.2	2
18:55:53	00:13:47	134180	793	158	88.8	0.1588	0.3138	99.3	2
18:58:00	00:15:54		679	133					3RD EVAC END

TOTAL: 00:15:54

AVERAGE:

% EFFICIENCY:

182

82.0

0.1305

0.2611

89.4

TIME	ELAP. TIME	AREA	FT/MIN	CFM	PPM	LBS/MIN	LBS	%EFF.	COMMENTS
18:58:21			655	131					4TH EVAC START
19:03:32	00:04:11	21058	1377	270	14.7	0.0445	0.0889	99.8	2
19:05:28	00:06:08	25888	1237	243	17.8	0.0483	0.0967	99.8	2
19:07:31	00:08:10	38512	1042	205	28.3	0.0803	0.1205	99.7	2
19:08:35	00:10:14	108208	927	182	72.7	0.1481	0.2962	99.3	2
19:11:38	00:12:18	59644	832	183	40.4	0.0738	0.1477	99.6	2
19:13:47	00:14:28	88840	781	153	48.5	0.0788	0.1596	99.8	2
19:14:00	00:14:39		655	129					4TH EVAC END

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02/08/93 11:45 40 828 0648

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TIME	ELAP. TIME	AREA	FT/MIN	CFM	PPM	LBS/MIN	LBS	%EFF.	COMMENTS
19:18:31			867	128					5TH EVAC START
19:20:58	00:02:27	58458	1395	274	38.2	0.1173	0.2348	98.4	2
19:23:12	00:04:41	28782	1298	237	18.8	0.0481	0.0962	99.8	2
19:25:22	00:06:51	35592	1013	199	24.4	0.0543	0.1085	99.7	2
19:27:17	00:08:48	43440	923	181	29.8	0.0600	0.1201	99.7	2
19:29:14	00:10:45	49312	832	163	33.5	0.0813	0.1225	99.7	2
19:31:25	00:12:54	58512	808	158	38.3	0.0878	0.1957	99.7	2
19:33:00	00:14:28		858	129					5TH EVAC END 2

TOTAL: 00:12:02

AVERAGE: 184 30.4 0.0603 0.1368

% EFFICIENCY: 99.7

TIME	ELAP. TIME	AREA	FT/MIN	CFM	PPM	LBS/MIN	LBS	%EFF.	COMMENTS
19:35:21			880	130					6TH EVAC START
19:38:41	00:03:20	17712	1408	278	12.5	0.0385	0.1158	99.7	3
19:41:08	00:05:45	26240	1143	224	17.5	0.0439	0.0878	99.8	2
19:43:07	00:07:46	30976	1012	198	21.3	0.0474	0.0947	99.8	2
19:45:03	00:09:42	36828	826	182	25.2	0.0513	0.1027	99.8	2
19:47:17	00:11:58	41644	817	180	28.3	0.0508	0.1017	99.8	2
19:48:26	00:14:05	47984	788	150	32.6	0.0548	0.1088	99.7	2

TOTAL: 00:14:05

AVERAGE: 188 21.5 0.0478 0.1021

% EFFICIENCY: 99.8

## SUMMARY.

	EVAC #1	EVAC #2	EVAC #3	EVAC #4	EVAC #5	EVAC #6
% EFF	99	94	99	100	100	100

AVERAGE SCRUBBER EFFICIENCY AS TESTED: 99

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BALTIMORE QUALITY ASSURANCE-STACK TEST  
 RUN NO. 2  
 STANDARD CURVE-12/02/92

PPM	2.1	9.9	50.0	99.1	PPM (%)	AREA (Y)
AREA	2884	12800	62272	125138	0	0
	2528	12804	63138	125984	2.1	2582
	2535	13208	65440	124320	9.9	12804
					50.0	63618
					99.1	125147
AV. AREA	2592	12804	63816	125147		
STD. DEV.	71.85	248.21	1337.18	678.37	r=	0.8889
COEVAR	0.03	0.02	0.02	0.01	y-int=	163.08
% DIFF.	2.8	1.8	2.1	0.5	m=	1262.84

TIME	ELAP. TIME	AREA	FT/MIN	CFM	PPM	LBS/MIN	LBS	%EFF.	COMMENTS
18:03:05			705	138					1ST EVAC START
18:13:34	00:10:29	194400	1834	321	163.8	0.5520	1.1053	87.4	2
18:16:26	00:13:20	60480	1332	262	39.8	0.1167	0.2334	89.4	2
18:19:20	00:16:15	30224	690	118	23.8	0.0309	0.0618	99.9	2
18:22:16	00:19:10	64884	897	137	436.3	0.6672	1.3346	86.8	2
18:25:34	00:22:28	8518584	607	119	5182.1	8.8807	13.7814	87.2	2
18:28:00	00:24:55		848	127					1ST EVAC END

TOTAL: 00:24:55

AVERAGE:

% EFFICIENCY:

174

1183.0

1.8518

3.3033

82.1

TIME	ELAP. TIME	AREA	FT/MIN	CFM	PPM	LBS/MIN	LBS	%EFF.	COMMENTS
18:31:01			703	138					2ND EVAC START
18:33:56	00:02:55	305432	1449	285	241.7	0.7702	1.5404	96.3	2
18:36:45	00:05:44	328048	1189	233	258.0	0.6747	1.3484	96.8	2
18:39:38	00:08:35	189024	1019	200	167.5	0.3528	0.7057	98.3	2
18:42:41	00:11:40	527000	920	181	417.2	0.8440	1.6879	96.0	2
18:45:00	00:13:58		718	141					2ND EVAC END

TOTAL: 00:13:58

AVERAGE:

% EFFICIENCY:

198

288.8

0.8604

1.3208

86.9

TIME	ELAP. TIME	AREA	FT/MIN	CFM	PPM	LBS/MIN	LBS	%EFF.	COMMENTS
18:47:15			728	143					3RD EVAC START
18:53:12	00:05:57	578504	1520	298	458.3	1.5254	3.0508	92.7	2
18:58:10	00:08:55	169376	1053	207	134.0	0.3103	0.6205	98.5	2
18:59:07	00:11:52	220182	840	186	174.2	0.3601	0.7203	98.3	2
19:01:53	00:14:38	187612	864	170	148.3	0.2818	0.5637	88.7	2
19:03:00	00:16:45		820	181					3RD EVAC END

TOTAL: 00:16:45

AVERAGE:

% EFFICIENCY:

194

228.2

0.8194

1.2388

87.1

TIME	ELAP. TIME	AREA	FT/MIN	CFM	PPM	LBS/MIN	LBS	%EFF.	COMMENTS
19:07:24			720	141					4TH EVAC START
19:08:07	00:01:43	432112	1416	278	342.0	1.0660	2.1301	94.8	2
19:12:00	00:04:36	147224	1184	232	118.4	0.3032	0.6064	98.6	2
19:16:04	00:07:40	82424	888	184	85.1	0.1416	0.2830	99.3	2
19:17:47	00:10:23	188512	878	172	149.1	0.2880	0.5759	98.6	2
19:20:32	00:13:08	70384	830	163	55.8	0.1015	0.2030	99.5	2
19:21:00	00:13:36		815	160					4TH EVAC END

TOTAL: 00:13:38

AVERAGE:

% EFFICIENCY:

192

145.7

0.3798

0.7597

98.2

02/05/02 09:39 8477851069

COSMED OF IL →→→ BQA

011/019

02/08/93 11:46 401 828 0648

COSMED MED S111 →→→ SO PLAINFIELD

010/018

Draft

TIME	ELAP. TIME	AREA	FT/MIN	CFM	PPM	LBS/MIN	LBS	%EFF.	COMMENTS
19:23:46			786	154					5TH EVAC START
19:28:48	00:03:02	288544	1468	288	228.8	0.7271	1.4541	98.5	2
19:29:48	00:08:02	43980	1168	220	34.7	0.0887	0.1778	99.8	2
19:32:49	00:09:03	174504	958	188	138.0	0.2908	0.5818	98.8	2
19:35:54	00:12:08	77180	848	187	61.0	0.1137	0.2274	99.5	2
19:38:00	00:14:14		802	157					5TH EVAC END

TOTAL: 00:14:14

AVERAGE:

197

115.1

0.3051

0.6102

% EFFICIENCY:

98.6

TIME	ELAP. TIME	AREA	FT/MIN	CFM	PPM	LBS/MIN	LBS	%EFF.	COMMENTS
19:39:38			708	132					5TH EVAC START
19:44:23	00:04:47	188720	1458	288	147.7	0.4738	1.4209	96.8	3
19:47:57	00:08:21	131980	1020	200	104.4	0.2341	0.4682	98.8	2
19:51:32	00:11:58	51320	931	183	40.5	0.0829	0.1659	99.8	2
19:54:22	00:14:48	1882	841	165	1.4	0.0027	0.0054	100.0	2
19:56:00	00:16:24		810	169					

TOTAL: 00:16:24

AVERAGE:

188

73.6

0.1883

0.6161

% EFFICIENCY:

98.8

SUMMARY:

	EVAC #1	EVAC #2	EVAC #3	EVAC #4	EVAC #5	EVAC #6
% EFF.	82	87	87	88	98	99

AVERAGE SCRUBBER EFFICIENCY AS TESTED:

97

02/05/02 09:39 8477851089

COSMED OF IL --- BQA

012/019

02/08/93 11:47 401 828 0648

COSMED MED STEEL --- SO PLAINFIELD

011/018

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**BALTIMORE QUALITY ASSURANCE-STACK TEST DATA**

**RE-TEST**

RUN NO. 1 - 01/26/93

RUN NO. 2 - 01/26/93

RUN NO. 3 - 01/26/93

02/05/02 09:41 8477851069

COSMED OF IL -&gt; BQA

013/019

02/08/93 11:47 401 828 0648

COSMED MED STEL -&gt; SO PLAINFIELD

012/018

Draft

BALTIMORE QUALITY ASSURANCE-STACK TEST  
RUN NO. 1  
STANDARD CURVE-01/26/93

PPM	9.8	50.0	99.1	530.0	PPM (X)	AREA (Y)
AREA	9640	53786	113296	539632	0	0
	9748	56328	113592	540884	9.8	9690
	9892	55584	114580	572114	50.0	65229
			111288		99.1	113189
					530.0	550870
AV. AREA	9690	65229	113189	550870		
STD. DEV.	44	1077	1196	15030	r=	0.9998
COE.VAR.	0.00	0.02	0.01	0.03	y-int=	2985.9
% DIFF.	0.5	2.0	1.1	2.7	m=	1038.3

TIME	ELAP. TIME	AREA	FT/MIN	CFM	PPM	LBS/MIN	LBS	%EFF.	COMMENTS
12:48:27									1ST EVAC START
12:50:27	00:02:00	88472	1857	365	93.1	0.3802	0.7604	98	2
12:53:18	00:04:40	52636	1831	320	47.9	0.1718	0.3437	99	2
12:55:20	00:06:59	91788	1528	300	27.8	0.0933	0.1866	100	2
12:57:29	00:09:02	18224	1412	277	15.7	0.0487	0.0973	100	2
12:59:58	00:11:31	31580	1382	287	27.8	0.0828	0.1652	100	2
13:02:30	00:14:03	29180	1198	235	25.3	0.0888	0.1332	100	2
13:04:00	00:15:33								1ST EVAC END

TOTAL: 00:15:33

AVERAGE: 284 39.6 0.1405 0.2811

% EFFICIENCY: 99

TIME	ELAP. TIME	AREA	FT/MIN	CFM	PPM	LBS/MIN	LBS	%EFF.	COMMENTS
13:08:00									2ND EVAC START
13:08:10	00:02:10	NO	NO	NO	NO	NO	NO	ND	
13:10:22	00:04:22	124444	1828	368	117.2	0.4714	0.9428	98	2
13:12:34	00:06:34	282280	1732	340	250.2	0.9530	1.9060	95	2
13:15:03	00:08:03	286428	1521	289	283.2	0.9471	1.8942	95	2
13:18:58	00:12:56	253880	1312	258	242.1	0.8884	1.3969	97	2
13:20:00	00:14:00								2ND EVAC END

TOTAL: 00:14:00

AVERAGE: 251 178.5 0.8140 1.2280

% EFFICIENCY: 97

TIME	ELAP. TIME	AREA	FT/MIN	CFM	PPM	LBS/MIN	LBS	%EFF.	COMMENTS
13:21:00									3RD EVAC START
13:23:06	00:02:06	186636	1935	380	167.8	0.6720	1.3439	87	2
13:25:29	00:04:29	134024	1782	352	128.4	0.4883	0.8886	88	2
13:27:38	00:06:38	120518	1578	310	113.4	0.3838	0.7671	88	2
13:30:16	00:08:16	105004	1351	265	88.4	0.2826	0.5649	89	2
13:32:43	00:11:43	88864	1218	239	82.9	0.2220	0.4439	89	2
13:34:00	00:13:00								3RD EVAC END

TOTAL: 00:13:00

AVERAGE: 309 115.8 0.4156 0.8313

% EFFICIENCY: 98

TIME	ELAP. TIME	AREA	FT/MIN	CFM	PPM	LBS/MIN	LBS	%EFF.	COMMENTS
13:38:00									4TH EVAC START
13:38:14	00:02:14	58928	1922	377	54.0	0.2282	0.4563	99	2
13:40:14	00:04:14	54924	1780	350	50.1	0.1962	0.3924	99	2
13:42:24	00:06:24	54152	1685	307	49.4	0.1689	0.3398	99	2
13:44:45	00:08:45	51228	1298	255	46.8	0.1329	0.2658	99	2
13:47:19	00:11:19	47084	1175	231	42.5	0.1098	0.2198	99	2
13:48:00	00:13:00								4TH EVAC END

TOTAL: 00:13:00

AVERAGE: 304 48.5 0.1674 0.3348

% EFFICIENCY: 99

02/05/02 09:42 8477851089

COSMED OF IL →→→ BQA

014/019

02708/93 11:47 401 628 0648

COSMED MED STEAL →→→ SO PLAINFIELD

013/018

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TIME	ELAP. TIME	AREA	FT/MIN	CFM	PPM	LBS/MIN	LBS	%EFF.	COMMENTS
13:51:00									5TH EVAC START
13:52:57	00:01:57	36800	1939	381	32.8	0.1391	0.2783	99	2
13:55:23	00:04:23	36312	1788	351	32.2	0.1284	0.2529	99	2
13:57:31	00:06:31	35688	1801	314	31.6	0.1111	0.2222	99	2
14:00:01	00:09:01	24084	1479	280	20.4	0.0882	0.1324	100	2
14:02:34	00:11:34	31852	1292	254	27.9	0.0791	0.1583	100	2
14:04:00	00:13:00								5TH EVAC END

TOTAL: 00:13:00

AVERAGE:

318

28.9

0.1044

0.2088

% EFFICIENCY:

100

TIME	ELAP. TIME	AREA	FT/MIN	CFM	PPM	LBS/MIN	LBS	%EFF.	COMMENTS
14:05:00									6TH EVAC START
14:06:11	00:02:11	27748	1820	357	23.9	0.0958	0.1813	100	2
14:10:36	00:04:36	28184	1702	334	22.4	0.0838	0.1878	100	2
14:12:47	00:06:47	28324	1598	314	22.5	0.0781	0.1583	100	2
14:15:29	00:09:29	24088	1376	270	20.4	0.0618	0.1231	100	2
14:17:37	00:11:37	23232	1240	243	19.6	0.0533	0.1085	100	2
14:20:00	00:14:00								6TH EVAC END

TOTAL: 00:14:00

AVERAGE:

304

21.7

0.0747

0.1484

% EFFICIENCY:

100

SUMMARY:

	EVAC #1	EVAC #2	EVAC #3	EVAC #4	EVAC #5	EVAC #6
% EFF.	98	87	98	98	100	100

AVERAGE SCRUBBER EFFICIENCY AS TESTED: 99



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## BALTIMORE QUALITY ASSURANCE-STACK TEST

RUN NO. 2

STANDARD CURVE 01/28/93

PPM	9.0	50.0	99.1	530.0
AREA	9640	53788	113298	539832
	9748	56328	113582	540864
	9882	55584	114580	572114
			111288	
AV. AREA	9890	56229	113189	550870
STD. DEV.	44.46	1077.25	1198.09	15030.19
COEVAR.	0.00	0.02	0.01	0.03
% DIFF.	0.5	2.0	1.1	2.7

PPM (X)	AREA (Y)
0	0
9.9	9890
50.0	55229
99.1	113189
530.0	550870
r=	0.9998
y-int=	2986.8
m=	1036.3

TIME	ELAP. TIME	AREA	FT/MIN	CFM	PPM	LBS/MIN	LBS	%EFF.	COMMENTS
17:45:18									1ST EVAC START
17:47:18	21:02:00	11672	1936	380	8.4	0.0357	0.0713	100	2
17:48:26	00:04:08	7748	1720	338	4.6	0.0174	0.0347	100	2
17:51:57	00:06:41	16080	1610	286	11.7	0.0387	0.0774	100	2
17:54:15	00:08:59	10338	1470	289	7.1	0.0228	0.0458	100	2
17:57:22	00:12:06	9448	1238	243	8.2	0.0170	0.0340	100	2
17:59:38	00:14:22	10938	1190	234	7.7	0.0201	0.0402	100	2
18:00:00	00:14:44								1ST EVAC END

TOTAL: 00:14:44

AVERAGE: 297 7.6 0.0259 0.0508

% EFFICIENCY: 100

TIME	ELAP. TIME	AREA	FT/MIN	CFM	PPM	LBS/MIN	LBS	%EFF.	COMMENTS
18:02:24									2ND EVAC START
18:04:24	00:02:00	22514	1928	379	18.8	0.0799	0.1598	100	2
18:07:00	00:04:36	218442	1827	359	208.0	0.8275	1.6551	98	2
18:09:55	00:07:31	212320	1741	342	202.0	0.7734	1.5467	98	2
18:12:27	00:10:03	178800	1620	299	169.6	0.6684	1.1328	97	2
18:14:50	00:12:26	145688	1328	281	137.8	0.4018	0.8038	98	2
18:17:38	00:15:14	102784	1240	243	86.9	0.2826	0.5262	99 2ND EVAC END	2

TOTAL: 00:15:14

AVERAGE: 314 148.8 0.5288 1.0598

% EFFICIENCY: 87

TIME	ELAP. TIME	AREA	FT/MIN	CFM	PPM	LBS/MIN	LBS	%EFF.	COMMENTS
18:19:36									3RD EVAC START
18:21:36	00:02:00	85882	1902	373	60.7	0.2538	0.5078	99	2
18:24:37	00:05:02	89312	1910	355	64.0	0.2547	0.5095	99	2
18:27:04	00:07:29	33888	1631	320	28.8	0.1072	0.2145	98	2
18:28:18	00:08:44	76672	1618	288	70.0	0.2338	0.4676	98	2
18:30:00	00:10:26								3RD EVAC END

TOTAL: 00:10:25

AVERAGE: 337 58.2 0.2124 0.4218

% EFFICIENCY: 99

TIME	ELAP. TIME	AREA	FT/MIN	CFM	PPM	LBS/MIN	LBS	%EFF.	COMMENTS
18:34:57									4TH EVAC START
18:38:57	00:02:00	49538	1857	385	44.9	0.1834	0.3669	99	2
18:39:17	00:04:20	45200	1782	350	40.7	0.1598	0.3193	99	2
18:41:45	00:06:48	42452	1854	325	38.1	0.1385	0.2770	99	2
18:44:18	00:09:19	43640	1530	300	39.2	0.1320	0.2640	99	2
18:48:53	00:11:58	38852	1308	257	34.8	0.0895	0.1791	100	2
18:49:00	00:13:03								4TH EVAC END

TOTAL: 00:13:03

AVERAGE: 319 38.5 0.1428 0.2852

% EFFICIENCY: 98

02/05/02 09:44 8477851069

COSMED OF IL →→→ BQA

016/019

02/08/93 11:48 46 828 0648

COSMED MED STELL →→→ SO PLAINFIELD

015/018

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TIME	ELAP. TIME	AREA	FT/MIN	CFM	PPM	LBS/MIN	LBS	%EFF.	COMMENTS
18:50:01									5TH EVAC START
18:52:01	00:02:00	31524	1821	358	27.5	0.1103	0.2208	99	2
18:54:28	00:04:25	28424	1708	335	24.5	0.0822	0.1844	100	2
18:57:55	00:07:54	28304	1830	320	24.4	0.0875	0.1751	100	2
18:00:24	00:10:23	27278	1512	297	23.4	0.0779	0.1559	100	3
18:02:00	00:11:59								5TH EVAC END

TOTAL: 00:11:59

AVERAGE:

327

25.0

0.0820

0.1840

% EFFICIENCY:

100

TIME	ELAP. TIME	AREA	FT/MIN	CFM	PPM	LBS/MIN	LBS	%EFF.	COMMENTS
18:05:00									6TH EVAC START
18:07:05	00:02:05	22452	1785	352	18.8	0.0741	0.1483	100	2
18:09:42	00:04:42	20944	1832	320	17.3	0.0622	0.1244	100	2
18:12:03	00:07:03	20532	1540	302	16.9	0.0573	0.1147	100	2
18:14:23	00:09:23	20372	1302	268	16.8	0.0480	0.0961	100	2
18:16:00	00:11:00								6TH EVAC END

TOTAL: 00:11:00

AVERAGE:

308

17.5

0.0604

0.1208

% EFFICIENCY:

100

SUMMARY:

	EVAC #1	EVAC #2	EVAC #3	EVAC #4	EVAC #5	EVAC #6
% EFF.	100	97	99	99	100	100

AVERAGE SCRUBBER EFFICIENCY AS TESTED: 99

02/05/02 09:44 8477851069

COSMED OF IL →→→ BQA

017/019

02/08/93 11:48 401 828 0648

COSMED MED STE →→→ SO PLAINFIELD

016/018

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## BALTIMORE QUALITY ASSURANCE-STACK TEST

RUN NO. 3

STANDARD CURVE-01/26/93

PPM	8.8	50.0	99.1	530.0	PPM (X)	AREA (Y)
AREA	9540	53786	113288	539832	0	0
	9748	56328	113592	540864	8.8	9690
	9882	55584	114580	572114	50.0	55228
			111288		99.1	113189
					530.0	550870
AV. AREA	9890	55228	113189	550870		
STD. DEV.	44.45	1077.25	1198.09	16030.18	r=	0.9988
COE. VAR.	0.00	0.02	0.01	0.03	y-int=	2985.8
% DIFF.	0.5	2.0	1.1	2.7	m=	1038.3

TIME	ELAP. TIME	AREA	FT/MIN	CFM	PPM	LBS/MIN	LBS	%EFF.	COMMENTS
18:48:31									1ST EVAC START
19:50:31	00:02:00	8728	1841	381	5.6	0.0237	0.0710	100	3
19:53:28	00:04:57	2020	1878	389	ND	ND	ND	ND	2
19:55:54	00:07:23	1864	1730	340	ND	ND	ND	ND	2
19:58:14	00:08:43	8435	1525	298	3.3	0.0112	0.0223	100	2
20:00:45	00:12:14	10874	1481	287	7.7	0.0248	0.0485	100	2
20:04:28	00:13:55	2844	1320	259	ND	ND	ND	ND	2
20:05:00	00:18:29								1ST EVAC END

TOTAL: 00:16:28

AVERAGE: 323 3.3 0.0118 0.0288

% EFFICIENCY: 100

TIME	ELAP. TIME	AREA	FT/MIN	CFM	PPM	LBS/MIN	LBS	%EFF.	COMMENTS
20:08:14									2ND EVAC START
20:08:14	00:02:00	45510	1832	360	41.0	0.1853	0.3306	99	2
20:10:57	00:04:43	38446	1740	342	34.2	0.1309	0.2819	99	2
20:13:38	00:07:24	231722	1883	330	220.7	0.8188	1.8338	99	2
20:16:18	00:10:04	235304	1627	300	224.2	0.7528	1.6056	98	2
20:18:54	00:12:40	128582	1392	273	122.1	0.3730	0.7478	98	2
20:20:00	00:18:48								2ND EVAC END

TOTAL: 00:13:48

AVERAGE: 321 128.5 0.4480 0.8959

% EFFICIENCY: 98

TIME	ELAP. TIME	AREA	FT/MIN	CFM	PPM	LBS/MIN	LBS	%EFF.	COMMENTS
20:21:30									3RD EVAC START
20:23:30	00:02:00	20746	1918	377	17.1	0.0723	0.1446	100	2
20:25:51	00:04:21	52980	1788	351	48.2	0.1898	0.3795	99	2
20:28:12	00:06:42	87080	1672	328	81.1	0.2883	0.5888	99	2
20:30:31	00:08:01	18814	1486	282	16.2	0.0530	0.1081	100	2
20:35:00	00:13:30								3RD EVAC END

TOTAL: 00:13:30

AVERAGE: 337 40.7 0.1533 0.3087

% EFFICIENCY: 99

TIME	ELAP. TIME	AREA	FT/MIN	CFM	PPM	LBS/MIN	LBS	%EFF.	COMMENTS
20:38:22									4TH EVAC START
20:38:22	00:02:00	51174	1897	372	48.5	0.1940	0.3880	99	2
20:40:51	00:04:29	44400	1743	342	40.0	0.1532	0.3084	99	2
20:43:05	00:06:43	13014	1631	320	9.7	0.0347	0.0694	100	2
20:45:20	00:08:58	40204	1482	281	35.9	0.1170	0.2341	99	2
20:47:51	00:11:29	38138	1305	258	33.9	0.0973	0.1947	100	2
20:50:00	00:13:38								4TH EVAC END

TOTAL: 00:13:38

AVERAGE: 318 33.2 0.1182 0.2385

% EFFICIENCY: 99

02/05/02 09:45 8477851069

COSMED OF IL →→ BQA

018/019

02/08/93 11:49 40 328 0648

COSMED MED STL →→ SO PLAINFIELD

017/018

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TIME	ELAP. TIME	AREA	FT/MIN	CFM	PPM	LBS/MIN	LBS	%EFF.	COMMENTS
20:51:42									5TH EVAC START
20:53:42	00:02:00	30560	1923	378	28.8	0.1125	0.2251	99	2
20:58:08	00:04:24	29880	1862	368	25.7	0.1054	0.2108	99	2
20:58:41	00:06:59	28484	1785	350	22.7	0.0880	0.1780	100	2
21:01:05	00:09:23	7498	1813	317	4.3	0.0152	0.0306	100	2
21:03:32	00:09:50	8298	1491	293	3.2	0.0105	0.0210	100	2
21:05:00	00:13:18								5TH EVAC END

TOTAL: 00:13:18

AVERAGE:

341

18.8

0.0806

0.1811

% EFFICIENCY:

100

TIME	ELAP. TIME	AREA	FT/MIN	CFM	PPM	LBS/MIN	LBS	%EFF.	COMMENTS
21:08:42									6TH EVAC START
21:08:42	00:02:00	21692	1892	371	18.1	0.0751	0.1502	100	2
21:10:58	00:04:14	21102	1723	338	17.5	0.0682	0.1325	100	2
21:13:17	00:06:35	20786	1612	317	17.2	0.0608	0.1218	100	2
21:16:37	00:08:55	18906	1508	298	18.3	0.0541	0.1083	100	2
21:18:36	00:10:54	18550	1421	279	15.0	0.0459	0.0938	100	2
21:20:00	00:13:18								6TH EVAC END

TOTAL: 00:13:18

AVERAGE:

370

17.3

0.0608

0.1213

% EFFICIENCY:

100

SUMMARY:

	EVAC #1	EVAC #2	EVAC #3	EVAC #4	EVAC #5	EVAC #6
% EFF.	100	98	99	99	100	100

AVERAGE SCRUBBER EFFICIENCY AS TESTED: 99

02/05/02 09:46 8477851069

COSMED OF IL --- BQA

019/019

02/03/93 11:49 401 828 0648

COSMED MED STEL. --- SO PLAINFIELD

018/018

COSMED II, INC.  
8 Industrial Drive  
Coventry, RI 02816  
(401) 828-0080  
Fax: (401) 828-0648

FAX COVER SHEET

DATE: February 8, 1993

No. of Pages: 17  
(Including Coverpage)

Company: State of Maryland - Dept. of the Environment

Attn: Mr. Steven Papaminas

From: Steven J. Ferris  
General Manager

RE: Baltimore Quality Assurance - Preliminary Stack Test Results

MESSAGE:

Dear Steven:

The following is a completed summary of the testing performed at Baltimore Quality Assurance Countercurrent Packed Tower Ethylene Oxide Scrubber. Please review this data and feel free to contact me if you have any questions. The Final report is currently in preparation and should be completed by the end of this week.

Sincerely,

*Steven J. Ferris*

Steven J. Ferris  
General Manager



**Cosmed  
of Illinois**

ATTACHMENT 5

*a Cosmed Group, Inc. affiliate*

**To:** Ms. Marilyn L. Gower  
**Company:** USEPA  
**From:** Mark Kloster  
**Pages:** 7 (Including this cover sheet)  
**Re:** Baltimore Quality Assurance Audit  
**Date:** Tuesday, February 05, 2002

Ms. Gower,

Here is a copy of the contract with American Chemical Exchange. Since 1996 the business has moved to:

American Chemical Exchange, Inc.  
159 N. Marengo Avenue  
Suite 103  
Pasadena, CA 91101-4505  
(626) 564-4502



**Cosmed  
of Illinois**

a Cosmed Group affiliate

---

**DATE:** December 12, 1996  
**PAGES:** 6 (INCLUDING COVER SHEET)  
**COMPANY:** American Chemical Exchange  
**ATTN. OF:** Robert Somerman  
**FROM:** Mark Kloster *mk*  
**SUBJECT:** Contract

**PER YOUR REQUEST:X FOR YOUR INFORMATION:X PLEASE RESPOND:**

Robert,

Here is my signed copy of the contract. Expect a FedEx delivery with two copies for you to sign tomorrow. Please send me one of these two copies for my records.

I am glad that we could contractually work out the differences between our companies and do business again. I look forward to working with your company for our mutual benefit.

**IF YOU HAVE ANY QUESTIONS OR PROBLEMS, INFORM SENDER AT:**

1160 Northpoint Boulevard, Waukegan, IL 60085 Tel. (708) 785-1060 Fax (708) 785-1069



02/05/02 11:47  
12/12/1996 09:51

8477851069  
907 79798

COSMED OF IL

AMERICAN ( IICAL EX

003/008

PAGE 01

## American Chemical Exchange Company, Inc.

9847 Hibiscus Court  
Alhambra, CA 91701

Telephone 909-484-2542  
Fax 909-987-0715

**To: Mark Kloster**  
**From: Robert Somerman**  
**Date: 12-12-96**  
**RE: Agreement**

Here is the agreement with corrections made. If everything looks alright, we are ready to sign.

Thanks,

Bob

## AGREEMENT

This Agreement between American Chemical Exchange Company, Inc., (ACE) and Cosmed Group Inc., (Generator) sets forth the terms and conditions under which American Chemical Exchange agrees to pay the Generator for removal of the ethylene glycol mixture (Mixture) produced as a by-product of Generator's ethylene oxide sterilization emissions control systems.

1. **Notifications:** All notifications and correspondence in regards to the terms and conditions of this Agreement will be made to:

American Chemical Exchange Co., Inc.  
9847 Hibiscus Court  
Alta Loma, California 91701  
Attn: Robert Somerman  
909-484-2542

Generator: Cosmed Group Inc.  
8 Industrial Drive  
Coventry, RI 02816

All notifications and changes to this Agreement will be made in writing.

2

**2. Charge or Payment Terms:**

Cosmed of New Jersey  
3459 South Clinton Avenue  
S. Plainfield, NJ 07080 2,500 gal \$0.12/gallon  
(908) 757-3727

ETO Sterilization  
2500 Brunswick Avenue  
Linden, NJ 07036 2,500 gal \$0.12/gallon  
(908) 862-7077

Baltimore Quality Assurance  
4200 Boston Street  
Baltimore, MD 21224 2,500 gal \$0.12/gallon  
(410) 327-0916

Cosmed of Rhode Island  
8 Industrial Drive  
Coventry, RI 02816 2,500 gal \$0.12/gallon  
(401) 828-0080

Cosmed of Illinois  
1160 Northpoint Boulevard  
Waukegan, IL 60085 2,500 gal \$0.12/gallon  
(847) 785-1060

Industrial Sterilization of Nevada  
1225-101 East Greg Street  
Sparks, NV 89431 2,500 gal \$0.12/gallon  
(702) 356-0609

**Payment:** Payment for the mixture shall be sent to the generating facility the day it is removed. The amount of the payment will be based on the estimated volume removed. Exact volume will be determined by tanker weight tickets. ACE will make adjustments by crediting or debiting future shipments based on this weight increase or decrease.

**Demurrage Charges:** The Generator will be responsible for all Demurrage charges resulting from any Generator caused occurrence that delays or prevents the loading of the mixture 2 hours after the tanker truck has arrived. The Demurrage charges will be \$80.00 per hour.

**Cancellation Charges:** The Generator will be responsible for any cancellation charge resulting from any Generator caused occurrence that would prevent a tanker truck from arriving on the day scheduled. Cancellation charges will total \$ 225.00 per occurrence.

In order to standardize procedures, the Mixture will not be neutralized. The Mixture will be shipped as a corrosive liquid that will be used in the manufacturing of Antifreeze. A UN number of 1760 will be assigned.

American Chemical Exchange will accept the Mixture in any condition and assume total responsibility for its condition and use after removal from the Generator's facility. In an effort to assist ACE, all Generator facilities will prepare a 16 ounce sample of the mixture. The sample should be labeled with the facility name and a request to send the results to ACE. The sample will be sent to the following locations for analysis four (4) business days prior to the scheduled pick up date.

#### **Laboratory**

Gabriel Labs  
1421 N. Elston Avenue  
Chicago, IL 60622  
Atten: Donna Panek  
(773)486-2123

Cosmed of Illinois  
Industrial Sterilization of Nevada

Carl Ruf  
30025 Dixon Road  
Salisbury, MD 21804  
(410)341-4024

Baltimore Quality Assurance  
Cosmed of New Jersey  
Cosmed of Rhode Island  
ETO Sterilization

3. **Compliance:** Both parties will comply with all applicable laws, statutes, rules and regulations concerning use, handling and transportation. According to EPA and the CFR parts 261.2 (e) and (f) glycols are exempt under hazardous waste definition and manifest requirements since these materials are used as ingredients to make other products. All tank trucks shall have the appropriate placard (s) for transport of Mixture.

4. **Material Safety Data Sheet:** The Generator shall provide the carrier with the appropriate MSDS with every shipment.

5. **Disclaimer of Warranties:** Generator makes no warranty, either expressed or implied, including any warranty of fitness for a particular or intended purpose of merchantability.

6. **Hold Harmless:** American Chemical Exchange will indemnify and hold Generator harmless from and against any and all claims, actions, charges, suits, liabilities, losses, costs and expenses, including reasonable attorneys' fees, resulting from the purchase, use or transportation of the Mixture or of any product made from the Mixture.

7. **Insurance:** All transporters and processors contracted by American Chemical Exchange to haul and use the Mixture maintain vehicle and liability insurance coverage in an amount no less than \$1,000,000 per occurrence and Workmen's Compensation as required by statute.

8. **Facilities, Personnel & Equipment:** On days of shipments, Generator's facilities and personnel will assist driver in pumping the Mixture into the tank truck. All Generator facilities will be equipped with a two (2) inch "A" style male cam & groove coupling. The tank trucks dispatched will have a pump, forty (40) feet of hose, and appropriate couplings / reducers to couple from the Generator's cam and groove coupling to the inlet side of the truck's pump. The tank truck will have additional hose and coupling / reducers, if needed, to connect the discharge side of the pump to the tank.

9. **Terms & Termination:** This Agreement shall remain in effect until terminated by either party upon 60 days prior written notice.

10. **Generator Coordinator:** All shipments, bills of lading, etc. shall be coordinated through Mark Kloster of Cosmed of Illinois.

**AMERICAN CHEMICAL EXCHANGE CO., INC.**By: \_\_\_\_\_  
Robert Somerman

Date: \_\_\_\_\_

**COSMED GROUP INC.**By: Mark Kloster  
Mark KlosterDate: 12-12-96**Addendum to Agreement**

1. Use: The material from Scrubber units will be used in the manufacture of:
- a. Automobile Coolants
  - b. Herbicides
  - c. Fire Extinguishing Fluids

TABLE 5 - SUMMARY OF ETHYLENE OXIDE EMISSIONS

BALTIMORE QUALITY ASSURANCE

CHAMBERS A AND B - SCRUBBER INLET AND OUTLET  
INITIAL AND FINAL EVACUATIONS  
RUN 3

	Scrubber Inlet		Scrubber Outlet	
	Initial Evacuation	Final Evacuation	Initial Evacuation	Final Evacuation
RUN I.D.	R3-IE-IN	R3-FE-IN	R3-IE-OUT	R3-FE-OUT
DATE	03/24/00	03/24/00	03/24/00	03/24/00
TIME STARTED	01:33	11:16	01:33	11:16
TIME ENDED	02:59	12:30	02:59	12:30

GAS PARAMETERS

Gas Temperature - ° F	54.1	61.0
Oxygen - %,dv	8.3	20.9
Carbon Dioxide - %,dv	49.8	0.0
Moisture - %	1.4 (1)	1.8 (1)

TOTAL GAS FLOW

Standard Volume - scf	15536 (2)	19042	15536
-----------------------	-----------	-------	-------

ETHYLENE OXIDE EMISSIONS

Concentration - ppmwv	98.8	184	14.2
Weight - lbs	207.17 (3)	0.18	0.401
Total lbs EtO	207.35	0.4259	

ETO REMOVAL EFFICIENCY - % 99.79%

- (1) Saturation assumed.
- (2) Assumed to be same as outlet flow.
- (3) Based on weight of EtO supply tank before and after discharge minus weight of residual EtO remaining in Chambers A and B after initial evacuation.

**TABLE 4 - SUMMARY OF ETHYLENE OXIDE EMISSIONS**

**BALTIMORE QUALITY ASSURANCE**

**CHAMBERS A AND B - SCRUBBER INLET AND OUTLET  
INITIAL AND FINAL EVACUATIONS  
RUN 2**

	Scrubber Inlet		Scrubber Outlet	
	<i>Initial Evacuation</i>	<i>Final Evacuation</i>	<i>Initial Evacuation</i>	<i>Final Evacuation</i>
RUN I.D.	<b>R2-IE-IN</b>	<b>R2-FE-IN</b>	<b>R2-IE-OUT</b>	<b>R2-FE-OUT</b>
DATE	03/23/00	03/23/00	03/23/00	03/23/00
TIME STARTED	09:07	20:53	09:07	20:53
TIME ENDED	10:45	22:10	10:45	22:10
<b>GAS PARAMETERS</b>				
Gas Temperature - ° F			53.0	58.1
Oxygen - %,dv			7.8	20.9
Carbon Dioxide - %,dv			51.2	0.0
Moisture - %			1.3 (1)	1.6 (1)
<b>TOTAL GAS FLOW</b>				
Standard Volume - scf		15082 (2)	19876	15082
<b>ETHYLENE OXIDE EMISSIONS</b>				
Concentration - ppmwv		57.2	183	3.84
Weight - lbs	210.06 (3)	0.10	0.416	0.007
Total lbs EtO	210.16		0.423	
<b>ETO REMOVAL EFFICIENCY - %</b>		99.80%		

- (1) Saturation assumed.  
 (2) Assumed to be same as outlet flow.  
 (3) Based on weight of EtO supply tank before and after discharge minus weight of residual EtO remaining in Chambers A and B after initial evacuation.



# TABLE 3 - SUMMARY OF ETHYLENE OXIDE EMISSIONS

## BALTIMORE QUALITY ASSURANCE

### CHAMBERS A AND B - SCRUBBER INLET AND OUTLET INITIAL AND FINAL EVACUATIONS RUN 1

	Scrubber Inlet		Scrubber Outlet	
	Initial Evacuation	Final Evacuation	Initial Evacuation	Final Evacuation
RUN I.D.	R1-IE-IN	R1-FE-IN	R1-IE-OUT	R1-FE-OUT
DATE	03/22/00	03/22/00	03/22/00	03/22/00
TIME STARTED	11:14	20:21	11:14	20:21
TIME ENDED	12:35	21:58	12:35	21:58
<b>GAS PARAMETERS</b>				
Gas Temperature - ° F			56.2	64.9
Oxygen - %,dv			10.5	20.9
Carbon Dioxide - %,dv			43.8	0.0
Moisture - %			1.5 (1)	2.1 (1)
<b>TOTAL GAS FLOW</b>				
Standard Volume - scf		16819 (2)	20006	16819
<b>ETHYLENE OXIDE EMISSIONS</b>				
Concentration - ppmwv		63.5	941	4.00
Weight - lbs	213.56 (3)	0.12	2.153	0.008
Total lbs EtO	213.68		2.160	
<b>ETO REMOVAL EFFICIENCY - %</b>		98.99%		

(1) Saturation assumed.

(2) Assumed to be same as outlet flow.

(3) Based on weight of EtO supply tank before and after discharge minus weight of residual EtO remaining in Chambers A and B after initial evacuation.

Table 2 - Summary of Test Program Results

	Run 1	Run 2	Run 3	Average
Scrubber Reduction Efficiency (%)	98.99	99.80	99.79	99.53
Chamber Exhaust Vent Emissions (lb/hr EtO)	< 0.0025	< 0.0025	< 0.0018	< 0.0023
	Scrubber Liquor Ethylene Glycol Content (% v/v)	Maximum Level of Scrubber Liquor in Tank (inches)		
First Stage Tank 1	21.67	47		
First Stage Tank 2	18.70	45		
First Stage Tank 3	9.29	45		
First Stage Tank 4	11.66	47		
Second Stage Tank Y	11.25	120		

< indicates pollutant concentrations below detection limit. The detection limit is provided.

## RECORD OF ETHYLENE GLYCOL DISPOSAL(S)

Date	Material Type	Volume	Disposal Method	Waste Hauler
<hr/>				
07/03/97	Ethylene Glycol	5,000gal.	Recycle	American Exchange Chemical Co.
<hr/>				
07/21/97	Ethylene Glycol	5,000 gal.	Recycle	American Exchange Chemical Co.
<hr/>				
08/09/97	Ethylene Glycol	400 gal.	Spill/broken pipe See Carnes folder	Recycled back into glycol tanks
<hr/>				
04/01/98	Ethylene Glycol	4,000 gal.	Recycle	American Exchange Chemical Co.
<hr/>				
11/05/98	Ethylene Glycol	4,000 gal	Recycle	Bass Oil
<hr/>				
11/06/98	Ethylene Glycol	4,179 gal	Recycle	Bass Oil
<hr/>				
10/26/99	Ethylene Glycol	5,000 gal	Recycle	ACE Chemical
<hr/>				
10/29/99	Ethylene Glycol	5,000 gal	Recycle	ACE Chemical

[illegible]

Date: January 9, 2001  
 To: Mark Kloster  
 From: Ellen Heath  
 Subj.: 2000 Usage - Permit #24-2960

*1 Nuke  
 3 pages*

\*\*\*\*\*

**Methyl Bromide:**

Methyl Bromide Usage

Pounds - Chamber C	156.9
Pounds - Chamber D	7.0
	-----
Total Pounds per year	163.9
Operating days - Chamber C	25
Operating days - Chamber D	1
	-----
Total Operating Days	26
Trailer fumigation's	0

\*\*\*\*\*

**Ethylene Oxide:**

ETO Usage - Annual	75,174 ✓
ETO Usage - Daily	439

Chamber Operating Days:

Chamber A	187 -
Chamber B	183
Chamber C	110
Chamber D	161
Chamber E	161

Pounds of Spice Sterilized:

Chamber A	13,034,187	
Chamber B	12,880,601	
Chamber C	3,102,265	
Chamber D	7,270,179	
Chamber E	5,502,742	Total Pounds 41,789,974

(AV) Gas Usage Per Chamber: */per day*

Chamber A	127	
Chamber B	127	
Chamber C	36	
Chamber D	68	
Chamber E	82	Total Usage 439 pounds

Baltimore Quality Assurance  
Calendar year, 2000

Gas Log

Month	A ETO	B ETO	C ETO	D ETO	E ETO	Total
January	2,093	2,084	512	753	1,183	6,625
February	2,294	2,651	579	1,208	1,434	8,166
March	2,518	2,526	581	1,342	1,394	8,361
April	2,039	2,037	788	1,332	1,397	7,593
May	1,680	1,689	429	868	980	5,646
June	2,104	2,269	545	711	1,016	6,645
July	2,042	2,174	239	745	1,107	6,307
August	2,154	2,146	39	1,207	1,280	6,826
September	1,658	1,419	0	526	716	4,319
October	2,253	1,779	153	788	1,031	6,004
November	1,656	1,187	193	924	954	4,914
December	1,184	1,187	230	531	636	3,768
	23,675	23,148	4,288	10,935	13,128	75,174

Operating Days

Month	Chamber A	Chamber B	Chamber C	Chamber D	Chamber E	Total
January	16	17	13	10	14	70
February	19	22	15	18	17	91
March	16	16	15	20	17	84
April	17	16	20	20	17	90
May	13	12	11	13	13	62
June	17	18	14	10	12	71
July	17	18	6	11	14	66
August	17	18	1	18	16	70
September	12	11	0	7	8	38
October	19	15	4	12	13	63
November	14	10	5	14	12	55
December	10	10	6	8	8	42
	187	183	110	161	161	802

Average Gas Usage / per day

Month	Chamber A	Chamber B	Chamber C	Chamber D	Chamber E	Total
January	131	123	39	75	85	453
February	121	121	39	67	84	431
March	157	158	39	67	82	503
April	120	127	39	67	82	435
May	129	141	39	67	75	451
June	124	126	39	71	85	445
July	120	121	40	68	79	428
August	127	119	39	67	80	432
September	138	129	0	75	90	432
October	119	119	38	66	79	420
November	118	119	39	66	80	421
December	118	119	38	66	80	421
	1,522	1,520	428	822	980	5,272

Average Gas	127	127	36	68	82	439
-------------	-----	-----	----	----	----	-----

→ actual usage / all chambers

→ lbs used in / year  
AV usage / ALL Chambers

**Baltimore Quality Assurance  
2000 Methyl Bromide Usage**

<b>Date</b>	<b>#'s of MB</b>	<b>Chamber C</b>	<b>Chamber D</b>	<b>Operating Days Chamber C</b>	<b>Operating Days Chamber D</b>
January	3.5	3.5	0	1	0
February	3.5	3.5	0	1	0
March	14	14	0	1	0
April	7.3	7.3	0	1	0
May	10.5	10.5	0	2	0
June	8.5	8.5	0	2	0
July	26	26	0	4	0
August	51.5	44.5	7	7	1
September	11	11	0	3	0
October	15	15	0	1	0
November	13.1	13.1	0	2	0
December	0	0	0	0	0
	163.9	156.9	7	25	1

**Baltimore Quality Assurance**  
**Calendar year, 2000 Treatments**  
**Pounds Processed Per Chamber**

**McCormick**

Month	A Pounds	B Pounds	C Pounds	D Pounds	E Pounds	Total
January	719,819	407,316	220,024	441,708	279,639	2,068,506
February	772,179	309,879	375,147	747,539	291,792	2,496,536
March	936,337	189,116	231,847	729,782	498,655	2,585,737
April	725,672	776,251	414,205	931,875	287,581	3,135,584
May	695,512	732,586	273,010	443,639	302,615	2,447,362
June	608,061	649,092	310,672	361,482	230,127	2,159,434
July	877,033	667,618	129,401	314,551	181,343	2,169,946
August	1,207,511	965,192	28,022	657,035	421,654	3,279,414
September	331,454	572,084	0	184,326	295,715	1,383,579
October	1,330,858	634,666	74,818	547,611	260,883	2,848,836
November	713,799	393,576	153,414	370,839	338,345	1,969,973
December	438,164	482,420	140,320	308,421	221,707	1,591,032
<b>Total</b>	<b>9,356,399</b>	<b>6,779,796</b>	<b>2,350,880</b>	<b>6,038,808</b>	<b>3,610,056</b>	<b>28,135,939</b>

**Baltimore Spice**

Month	A Pounds	B Pounds	C Pounds	D Pounds	E Pounds	Total
January	384,271	731,808	65,415	44,626	44,000	1,270,120
February	340,472	1,175,467	75,872	27,028	140,623	1,759,462
March	84,296	884,023	68,409	46,060	101,774	1,184,562
April	352,470	216,426	95,297	0	220,829	885,022
May	136,307	314,112	42,274	167,287	88,404	748,384
June	688,985	695,338	0	155,552	216,405	1,756,280
July	300,474	443,638	44,902	141,089	161,297	1,091,400
August	256,733	324,197	0	213,790	347,298	1,142,018
September	216,873	132,352	0	169,565	55,821	574,611
October	163,293	189,136	0	67,840	196,091	616,360
November	255,766	258,325	0	144,488	103,216	761,795
December	225,585	97,548	28,961	31,471	115,120	498,685
<b>Total</b>	<b>3,405,525</b>	<b>5,462,370</b>	<b>421,130</b>	<b>1,208,796</b>	<b>1,790,878</b>	<b>12,288,699</b>

**Other Customers**

Month	A Pounds	B Pounds	C Pounds	D Pounds	E Pounds	Total
January	4,100	4,800	0	0	0	8,900
February	0	110,831	0	0	0	110,831
March	10,400	0	164,734	0	0	175,134
April	0	2,700	50,561	22,575	4,800	80,636
May	2,400	35,090	3,600	0	0	41,090
June	63,919	20,457	67,870	0	33,708	185,954
July	11,200	0	0	0	0	11,200
August	0	122,112	0	0	0	122,112
September	47,793	101,862	0	0	70	149,725
October	66,138	170,587	43,490	0	33,230	313,445
November	110	2,000	0	0	30,000	32,110
December	66,203	67,996	0	0	0	134,199
<b>Total</b>	<b>272,263</b>	<b>638,435</b>	<b>330,255</b>	<b>22,575</b>	<b>101,808</b>	<b>1,365,336</b>

**Total**

Month	A Pounds	B Pounds	C Pounds	D Pounds	E Pounds	Total
January	1,108,190	1,143,924	285,439	486,334	323,639	3,347,526
February	1,112,651	1,596,177	451,019	774,567	432,415	4,366,829
March	1,031,033	1,073,139	464,990	775,842	600,429	3,945,433
April	1,078,142	995,377	560,063	954,450	513,210	4,101,242
May	834,219	1,081,788	318,884	610,926	391,019	3,236,836
June	1,360,965	1,364,887	378,542	517,034	480,240	4,101,668
July	1,188,707	1,111,256	174,303	455,640	342,640	3,272,546
August	1,464,244	1,411,501	28,022	870,825	768,952	4,543,544
September	596,120	806,298	0	353,891	351,606	2,107,915
October	1,560,289	994,389	118,308	615,451	490,204	3,778,641
November	969,675	653,901	153,414	515,327	471,561	2,763,878
December	729,952	647,964	169,281	339,892	336,827	2,223,916
<b>Total</b>	<b>13,034,187</b>	<b>12,880,601</b>	<b>3,102,265</b>	<b>7,270,179</b>	<b>5,502,742</b>	<b>41,789,974</b>



Date: January 12, 2000  
To: Mark Kloster  
From: Ellen Heath  
Subj.: 1999 Usage - Permit #24-2960

Mike  
4 pages

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METHYL BROMIDE:

Methyl Bromide Usage	219 pounds per year
	Chamber C - 205 pounds
	Chamber D - 14 pounds
Methyl Bromide Operating Days:	42 days
	Chamber C - 39 operating days
	Chamber D - 3 operating day
Trailer fumigation	0 trailers/containers

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ETHYLENE OXIDE:

ETO Usage - Annual	78,315 pounds/year	
ETO Usage - Daily	433 pounds/day	
Chamber Operating Days:		
Chamber A	202	
Chamber B	182	
Chamber C	140	
Chamber D	167	
Chamber E	183	
Pounds of Spice Sterilized:		
Chamber A	12,902,021	
Chamber B	11,496,066	
Chamber C	3,840,463	
Chamber D	6,873,082	
Chamber E	6,325,571	Total Pounds 41,437,203
Gas Usage Per Chamber:		
Chamber A	119	
Chamber B	114	
Chamber C	41	
Chamber D	71	
Chamber E	87	Total Usage 433

Baltimore Quality Assurance  
Calendar year, 1999

Gas Log

Month	A ETO	B ETO	C ETO	D ETO	E ETO	Total
January	2,400	1,620	780	1,500	1,620	7,920
February	2,520	1,350	810	1,425	1,530	7,635
March	2,760	1,605	585	1,530	1,980	8,460
April	2,400	1,860	675	1,275	1,530	7,740
May	1,693	1,740	557	1,075	1,291	6,356
June	1,484	1,443	284	779	1,169	5,159
July	1,178	1,562	309	825	1,110	4,984
August	1,566	1,688	326	708	1,129	5,417
September	2,154	1,928	199	477	1,126	5,884
October	1,682	1,691	239	478	918	5,008
November	2,392	2,162	509	787	1,194	7,044
December	1,925	1,925	558	969	1,331	6,708
	24,154	20,574	5,831	11,828	15,928	78,315

Operating Days

Month	Chamber A	Chamber B	Chamber C	Chamber D	Chamber E	Total
January	20	18	17	20	18	93
February	21	15	18	19	17	90
March	23	17	13	20	22	95
April	20	18	15	17	17	87
May	16	13	16	19	16	80
June	12	12	8	11	14	57
July	10	13	8	12	12	55
August	13	14	8	10	13	58
September	18	14	5	6	13	56
October	14	14	6	7	11	52
November	19	18	13	11	14	75
December	16	16	13	15	16	76
	202	182	140	167	183	874

Average Gas Usage

Month	Chamber A	Chamber B	Chamber C	Chamber D	Chamber E	Total
January	120	90	46	75	90	421
February	120	90	45	75	90	420
March	120	94	45	77	90	426
April	120	103	45	75	90	433
May	106	134	35	57	81	412
June	124	120	36	71	84	434
July	118	120	39	69	93	438
August	120	121	41	71	87	439
September	120	138	40	80	87	463
October	120	121	40	68	83	433
November	126	120	39	72	85	442
December	120	120	43	65	83	431
	1,434	1,371	492	852	1,042	5,192
Average Gas	119	114	41	71	87	433

Baltimore Quality Assurance  
Calendar year, 1999 Treatments  
Pounds Processed Per Chamber  
McCormick

Month	A Pounds	B Pounds	C Pounds	D Pounds	E Pounds	Total
January	829,208	736,800	291,095	559,656	274,403	2,691,162
February	904,573	403,795	298,920	299,985	298,979	2,206,252
March	775,198	510,563	278,158	444,261	288,314	2,296,494
April	651,841	663,152	281,208	559,549	306,092	2,461,842
May	675,223	647,970	340,842	607,979	452,608	2,724,622
June	760,395	607,588	294,690	198,476	382,386	2,243,535
July	709,040	765,185	205,545	397,743	396,601	2,474,114
August	656,533	683,410	203,293	348,965	360,431	2,252,632
September	719,334	657,054	183,545	256,303	437,600	2,253,836
October	636,922	366,371	111,530	186,046	145,137	1,446,006
November	633,694	502,557	318,656	301,933	465,543	2,222,383
December	763,608	628,395	327,449	505,050	223,190	2,447,692
Total	8,715,569	7,172,840	3,134,931	4,665,946	4,031,284	27,720,570

Baltimore Spice

Month	A Pounds	B Pounds	C Pounds	D Pounds	E Pounds	Total
January	470,672	584,859	183,485	318,441	386,065	1,943,522
February	345,385	333,782	127,229	243,735	300,487	1,350,618
March	298,275	461,817	0	519,193	415,975	1,695,260
April	499,808	369,079	179,834	133,778	103,486	1,285,985
May	324,344	322,532	87,331	195,660	126,703	1,056,570
June	44,967	193,384	0	130,315	37,865	406,531
July	148,070	95,543	1,100	89,951	41,446	376,110
August	232,577	236,023	0	71,357	144,074	684,031
September	416,200	266,732	0	14,091	0	697,023
October	285,408	676,437	8,470	67,996	123,841	1,162,152
November	525,204	424,031	22,882	0	76,868	1,048,985
December	412,416	217,626	0	60,556	384,426	1,075,024
Total	4,003,326	4,181,845	610,331	1,845,073	2,141,236	12,781,811

Other Customers

Month	A Pounds	B Pounds	C Pounds	D Pounds	E Pounds	Total
January	15,185	35		1,050		16,270
February	29,776	38,746	81,036	183,429	52,859	385,846
March	1,200	9,750	1,105	2,100		14,155
April	22,000	14,400	900	25,350	40,900	103,550
May	20,400	1,000	8,200		900	30,500
June	44,973	40,000		2,212	46,098	133,283
July	24,072	10,600	3,960	93,720	10,200	142,552
August						0
September	20,450				2,094	22,544
October	5,070	17,100				22,170
November						0
December		9,750		54,202		63,952
Total	183,126	141,381	95,201	362,063	153,051	934,822

*Mike  
2/2/99*

Baltimore Quality Assurance  
Calendar year, 1999 Treatments  
Pounds Processed Per Chamber

Total						
Month	A Pounds	B Pounds	C Pounds	D Pounds	E Pounds	Total
January	1,315,065	1,321,694	474,580	879,147	660,468	4,650,954
February	1,279,734	776,323	507,185	727,149	652,325	3,942,716
March	1,074,673	982,130	279,263	965,554	704,289	4,005,909
April	1,173,649	1,046,631	461,942	718,677	450,478	3,851,377
May	1,019,967	971,502	436,373	803,639	580,211	3,811,692
June	850,335	840,972	294,690	331,003	466,349	2,783,349
July	881,182	871,328	210,605	581,414	448,247	2,992,776
August	889,110	919,433	203,293	420,322	504,505	2,936,663
September	1,155,984	923,786	183,545	270,394	439,694	2,973,403
October	927,400	1,059,908	120,000	254,042	268,978	2,630,328
November	1,158,898	926,588	341,538	301,933	542,411	3,271,368
December	1,176,024	855,771	327,449	619,808	607,616	3,586,668
	12,902,021	11,496,066	3,840,463	6,873,082	6,325,571	41,437,203

Date: March 22, 1999  
Revised  
To: Mark Kloster  
From: Ellen Heath  
Subj.: 1998 Usage - Permit #24-2960

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METHYL BROMIDE:

Methyl Bromide Usage	271.5 pounds per year Chamber C - 236 pounds Chamber D - 35.5 pounds
Methyl Bromide Operating Days:	50 days Chamber C - 45 operating days Chamber D - 5 operating day
Trailer fumigation	0 trailers/containers

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ETHYLENE OXIDE:

ETO Usage - Annual	89,190 pounds/year	
ETO Usage - Daily	424 pounds/day	
Chamber Operating Days:		
Chamber A	240	
Chamber B	213	
Chamber C	158	
Chamber D	178	
Chamber E	221	
Pounds of Spice Sterilized:		
Chamber A	12,015,833	
Chamber B	12,218,020	
Chamber C	3,280,869	
Chamber D	5,490,870	
Chamber E	5,246,544	Total Pounds 38,252,136
Gas Usage Per Chamber:		
Chamber A	119	
Chamber B	94	
Chamber C	45	
Chamber D	77	
Chamber E	90	Total Usage 424

1998 Methyl Bromide Usage

Date	#s of MB	Chamber C	Chamber D	Operating Days Chamber C	Operating Days Chamber D
January	12	12	0	2	0
February	17	17	0	4	0
March	24.5	18	6.5	5	1
April	4.5	4.5	0	1	0
May	9	9	0	2	0
June	9	9	0	2	0
July	61.5	39.5	22	8	2
August	27	27	0	4	0
September	14.5	14.5	0	3	0
October	52.5	52.5	0	8	0
November	15.5	8.5	7	1.5	1.5
December	24.5	24.5	0	5	0
	271.5	236	35.5	45.5	4.5

Baltimore Quality Assurance  
Calendar year, 1998 Treatments  
Pounds Processed Per Chamber  
McCormick

Month	A Pounds	B Pounds	C Pounds	D Pounds	E Pounds	Total
December, 97	141,727	44,540	53,713	150,247	141,072	531,299
January	481,620	605,625	308,194	565,872	332,135	2,293,446
February	157,250	170,385	89,390	35,995	44,915	497,935
March	729,531	847,829	519,470	722,427	360,678	3,179,935
April	458,276	609,190	289,074	872,979	390,414	2,619,933
May	372,067	436,887	346,929	470,592	201,078	1,827,553
June	238,231	383,162	308,970	330,435	295,632	1,556,430
July	508,659	559,663	83,880	122,747	183,354	1,458,303
August	448,893	509,300	160,090	105,331	280,523	1,504,137
September	667,026	590,730	317,916	258,420	397,435	2,231,527
October	606,085	155,454	94,615	396,523	418,737	1,671,414
November	599,240	378,400	335,822	287,119	284,266	1,884,847
December	674,104	332,405	154,522	573,530	252,627	1,987,188
Total	6,082,709	5,623,570	3,062,585	4,892,217	3,582,866	23,243,947

Baltimore Spice

Month	A Pounds	B Pounds	C Pounds	D Pounds	E Pounds	Total
January	254,526	209,874				464,400
February	426,147	413,178	0	0	0	839,325
March	286,753	533,748	0	0	60,950	881,451
April	494,400	540,792	1,754	0	88,170	1,125,116
May	545,260	439,487	0	0	289,424	1,274,171
June	784,793	576,264	0	54,755	186,923	1,602,735
July	631,536	568,319	0	44,022	159,297	1,403,174
August	594,557	297,888	2,300	6,600	158,354	1,059,699
September	583,636	675,117	33,364	68,963	274,712	1,635,792
October	396,667	842,557	88,571	142,984	180,427	1,651,206
November	378,278	536,027	0	82,977	63,422	1,060,704
December	382,725	521,139	59,252	101,725	130,310	1,195,151
	5,759,278	6,154,390	185,241	502,026	1,591,989	14,192,924

Other Customers

Month	A Pounds	B Pounds	C Pounds	D Pounds	E Pounds	Total
January						0
February	21,048	0	0	0	24	21,072
March	28,603	43,448	0	800	7,100	79,951
April	9,757	23,550	33,000	1,701	0	68,008
May	5,900	0	0	8,000	35,800	49,700
June	30,067	7,892	0	68,274	50,613	156,846
July	41,488	50,750	0	1,200	90,950	184,388
August	67,219	35,932	8,918	9,750	780	122,599
September	0	20,794	0	44,000	2,297	67,091
October	111,491	164,398	44,838	113,149	25,197	459,073
November	0	52,250	0	0	0	52,250
December	0	85,586	0	0	0	85,586
	315,573	484,600	86,756	246,874	212,761	1,346,564

Baltimore Quality Assurance  
Calendar year, 1998 Treatments  
Pounds Processed Per Chamber

Total						
Month	A Pounds	B Pounds	C Pounds	D Pounds	E Pounds	Total
December, 97	141,727	44,540	53,713	150,247	141,072	531,299
January	736,146	815,499	308,194	565,872	332,135	2,757,846
February	604,445	583,563	89,390	35,995	44,939	1,358,332
March	1,044,887	1,425,025	519,470	723,227	428,728	4,141,337
April	962,433	1,173,532	323,828	874,680	478,584	3,813,057
May	923,227	876,374	346,929	478,592	526,302	3,151,424
June	1,053,091	967,318	308,970	453,464	533,168	3,316,011
July	1,181,683	1,178,732	83,880	167,969	433,601	3,045,865
August	1,110,669	843,120	171,308	121,681	439,657	2,686,435
September	1,250,662	1,286,641	351,280	371,383	674,444	3,934,410
October	1,114,243	1,162,409	228,024	652,656	624,361	3,781,693
November	977,518	966,677	335,822	370,096	347,688	2,997,801
December	1,056,829	939,130	213,774	675,255	382,937	3,267,925
	12,015,833	12,218,020	3,280,869	5,490,870	5,246,544	38,252,136



Baltimore Quality Assurance  
Calendar year, 1998

Gas Log

Month	A ETO	B ETO	C ETO	D ETO	E ETO	Total
January	2,280	1,665	900	1,800	1,980	8,625
February	2,760	2,070	855	1,065	2,070	8,820
March	2,655	2,205	810	1,500	1,890	9,060
April	2,280	1,800	810	1,575	1,710	8,175
May	2,280	1,440	630	1,125	1,710	7,185
June	2,745	1,770	705	1,320	2,025	8,565
July	2,400	1,530	270	675	1,425	6,300
August	1,995	1,440	405	300	1,080	5,220
September	2,520	1,620	495	900	1,440	6,975
October	2,400	1,800	360	1,350	2,070	7,980
November	2,160	1,350	450	825	1,170	5,955
December	2,040	1,350	405	1,275	1,260	6,330
	28,515	20,040	7,095	13,710	19,830	89,190

Operating Days

Month	Chamber A	Chamber B	Chamber C	Chamber D	Chamber E	Total
January	19	16	20	20	22	97
February	23	20	19	14	23	99
March	22	22	18	20	21	103
April	19	20	18	21	19	97
May	19	16	14	15	18	82
June	23	20	16	17	24	100
July	20	17	6	9	16	68
August	18	15	9	4	12	58
September	21	18	11	12	16	78
October	20	20	8	18	23	89
November	19	14	10	11	13	67
December	17	15	9	17	14	72
	240	213	158	178	221	1,010

Average Gas Usage

Month	Chamber A	Chamber B	Chamber C	Chamber D	Chamber E	Total
January	120	104	45	90	90	449
February	120	104	45	76	90	435
March	121	100	45	75	90	431
April	120	90	45	75	90	420
May	120	90	45	75	95	425
June	119	89	44	78	84	414
July	120	90	45	75	89	419
August	111	96	45	75	90	417
September	120	90	45	75	90	420
October	120	90	45	75	90	420
November	114	96	45	75	90	420
December	120	90	45	75	90	420
	1,425	1,129	539	919	1,078	5,089
Average Gas	119	94	45	77	90	424

## BALTIMORE QUALITY ASSURANCE

EO  
3780

## CHAMBER ACTIVITIES

Month/Year: Dec 98 (16<sup>th</sup> - 31<sup>st</sup>)

BALTIMORE QUALITY ASSURANCE

DATE	CHAMBER (A-E)	USAGE		DATE	CHAMBER (A-E)	USAGE		DATE	CHAMBER (A-E)	USAGE	
		Methyl Bromide (lbs)	Ethylene Oxide (lbs)			Methyl Bromide (lbs)	Ethylene Oxide (lbs)			Methyl Bromide (lbs)	Ethylene Oxide (lbs)
16	A		120	21	A		120	26	A		—
	B		90		B		90		B		—
	C		45		C		—		C		—
	D		75		D		75		D		—
	E		90		E		90		E		—
			420				375				0
17	A		—	22	A		120	27	A		—
	B		90		B		90		B		—
	C		45		C		—		C		—
	D		75		D		75		D		—
	E		90		E		90		E		—
			300				375				0
18	A		120	23	A		120	28	A		—
	B		90		B		90		B		—
	C		45		C	3 1/2	—		C		—
	D		75		D		75		D		—
	E		—		E		90		E		—
			330			3 1/2	375				0
19	A		120	24	A		—	29	A		—
	B		90		B		—		B		—
	C		—		C	5 1/2	—		C		—
	D		75		D		—		D		—
	E		90		E		—		E		—
			375			5 1/2	0				0
20	A		—	25	A		—	30	A		—
	B		—		B	12 1/2	—		B		—
	C		—		C	5 1/2	—		C		—
	D		—		D		—		D		—
	E		—		E		—		E		—
			0			5 1/2	0				0
						12 1/2	—	31			—
											0
											0
		MeBr	EO			MeBr	EO			MeBr	EO
TOTAL		0	1425	TOTAL		9	1,125	TOTAL		0	0

Pounds/Month

SUB-TOTAL: (from page 1)

TOTAL:

MeBr

15 1/2

24 1/2

EO

3,780

6,330

CHAMBER ACTIVITIES  
Month/Year: December 2001 BALTIMORE QUALITY ASSURANCE

## BALTIMORE QUALITY ASSURANCE

SUB-TOTAL:	MeBr	EO
(pounds/month)	5.5	1630

# CHAMBER ACTIVITIES

Month/Year:

BALTIMORE QUALITY ASSURANCE

DATE	CHAMBER (A-E)	USAGE		DATE	CHAMBER (A-E)	USAGE		DATE	CHAMBER (A-E)	USAGE	
		Methyl Bromide (lbs)	Ethylene Oxide (lbs)			Methyl Bromide (lbs)	Ethylene Oxide (lbs)			Methyl Bromide (lbs)	Ethylene Oxide (lbs)
16	A		/	21	A		/	26	A		118
	B		/		B		/		B		119
	C		/		C		/		C		-
	D		/		D		/		D		-
	E		/		E		/		E		-
											237
17	A		119	22	A		/	27	A		/
	B		119		B		/		B		/
	C		-		C		/		C		/
	D		-		D		/		D		/
	E		80		E		/		E		/
			318								
18	A		/	23	A		/	28	A		-
	B		/		B		/		B		-
	C	4	/		C		/		C		-
	D		/		D		/		D		-
	E		/		E		/		E		80
		4									80
19	A		121	24	A		/	29	A		119
	B		120		B		/		B		-
	C		39		C		/		C		-
	D		-		D		/		D		-
	E		80		E		/		E		-
			360								119
20	A		/	25	A		/	30	A		/
	B		/		B		/		B		/
	C		/		C		/		C		/
	D		/		D		/		D		/
	E		/		E		/		E		/
				31	A		-	31	D		-
					B		-		E		79
					C		-				79
	MeBr	EO			MeBr	EO			MeBr	EO	
TOTAL		4	678	TOTAL			0	TOTAL			515

Pounds/Month

SUB-TOTAL: (from page 1)

TOTAL:

MeBr

5.5

9.5

EO

1630

2823

